

WHAT IS CLAIMED IS:

1 . An optical apparatus comprising:

a variable configuration mirror unit having a reflecting surface for reflecting an incident light and capable of causing change in the configuration of the reflecting surface upon turning on electricity; and

a lens for bringing the incident light into an internal part,

wherein a mirror holding section for holding the variable configuration mirror unit is formed on said lens.

2 . The optical apparatus according to claim 1 further comprising an imaging device for photoelectrically converting light transmitted through said lens, wherein an imaging device holding section for holding the imaging device is additionally formed on said lens.

3 . The optical apparatus according to claim 1, wherein said lens is a prism having a free curved surface formed at least partially thereon.

4 . The optical apparatus according to claim 1, wherein said variable configuration mirror unit is held on said lens so that the reflecting surface thereof is concealed from

outside.

5 . The optical apparatus according to claim 1 further comprising a casing for protecting at an interior thereof said lens and said variable configuration mirror unit held on the lens, wherein said lens is formed with a portion abutting against said casing.

6 . The optical apparatus according to claim 1, wherein said lens is formed with a mounting portion for mounting onto an imaging apparatus to which the optical apparatus is applied.

7 . The optical apparatus according to claim 1, wherein said variable configuration mirror unit adjusts a focusing position of the incident light according to the configuration of said reflecting surface.

8 . The optical apparatus according to claim 1, wherein said variable configuration mirror unit adjusts a zoom ratio according to the configuration of said reflecting surface.

9 . An imaging apparatus having an optical apparatus for imaging, said optical apparatus comprising: a first and

second variable configuration mirrors each capable of being changed in the configuration of a reflecting surface thereof upon turning on electricity; a free curved surface prism having two opposite surfaces thereof serving as optical surface; and an imaging device for receiving a light introduced by said first and second variable configuration mirrors and the free curved surface prism,

wherein said first variable configuration mirror for reflecting light incident on a front side of the imaging apparatus body being provided on a first optical surface of the optical surfaces of the free curved surface prism facing a rear side of the imaging apparatus body;

said second variable configuration mirror for further reflecting the reflected light by said first variable configuration mirror being provided on a second optical surface of the optical surfaces of said free curved surface prism facing the front side of the imaging apparatus body; and

said imaging device for receiving the reflected light by said second variable configuration mirror being provided on the first optical surface of said free curved surface prism side by side in an up and down direction with said first variable configuration mirror.

10. The imaging apparatus according to claim 9, wherein

at least one of said first and second variable configuration mirrors is provided so that the plane containing an outer periphery of the reflecting surface thereof is substantially vertical to a bottom plane of a imaging apparatus body.

11. The imaging apparatus according to claim 9, wherein the imaging surface of said imaging device is disposed in a manner inclined toward a vertical direction with respect to a bottom plane of the imaging apparatus body.

12. The imaging apparatus according to claim 9, wherein an electrical board is provided between said imaging device and an outer armor on the rear side of said imaging apparatus body.

13. The imaging apparatus according to claim 9, wherein an electrical board having a driving circuit of at least one of said first or second variable configuration mirror thereon is provided on said free curved surface prism on a side without an optical surface being formed.

14. An imaging apparatus having an optical apparatus for imaging, said optical apparatus comprising: a variable configuration mirror capable of being changed in the

configuration of a reflecting surface thereof upon turning on electricity; a free curved surface prism having two opposite surfaces thereof serving as optical surface; and an imaging device for receiving a light introduced by said variable configuration mirror and the free curved surface prism,

wherein said variable configuration mirror for reflecting light incident on a front side of the imaging apparatus body is provided on a first optical surface of the optical surfaces of said free curved surface prism facing a rear side of said imaging apparatus body; and

said imaging device for receiving the reflected light by said variable configuration mirror is provided on a second optical surface facing the front side of said imaging apparatus body.

15. The imaging apparatus according to claim 14, wherein the imaging surface of said imaging device is disposed substantially vertical to a bottom plane of the imaging apparatus body.

16. An imaging apparatus having an optical apparatus for imaging, said optical apparatus comprising: a first and second variable configuration mirrors each capable of being changed in the configuration of a reflecting surface

thereof upon turning on electricity; a lens; and an imaging device for effecting photoelectric conversion of a light formed into an image by said first and second variable configuration mirrors and the lens,

wherein a light incident on a front side of the imaging apparatus body is reflected substantially vertically by said first variable configuration mirror, and said reflected light by said first variable configuration mirror being further reflected toward a rear side of said imaging apparatus body by said second variable configuration mirror; and

said imaging device for receiving the reflected light by said second variable configuration mirror being provided so as to be at the rear side of said imaging apparatus body.

17. An imaging apparatus having an optical apparatus for imaging, said optical apparatus comprising: a first and second variable configuration mirrors each capable of being changed in the configuration of a reflecting surface thereof upon turning on electricity; a lens; and an imaging device for effecting photoelectric conversion of a light formed into an image by said first and second variable configuration mirrors and the lens,

wherein a light incident on a front side of the

imaging apparatus body is reflected substantially vertically by said first variable configuration mirror, and said reflected light by said first variable configuration mirror being further reflected toward the front side of said imaging apparatus body by said second variable configuration mirror; and

said imaging device for receiving the reflected light by said second variable configuration mirror being provided so as to be at the front side of said imaging apparatus body.

18. The imaging apparatus according to claim 17, wherein the imaging surface of said imaging device is disposed so as to be substantially vertical to a bottom plane of the imaging apparatus body.

19. The imaging apparatus according to claim 16, wherein said lens is provided in an optical path between said first and second variable configuration mirrors.

20. The imaging apparatus according to claim 17, wherein said lens is provided in an optical path between said first and second variable configuration mirrors.

21. An imaging apparatus having an optical apparatus for

imaging, said optical apparatus comprising: a first and second variable configuration mirrors each capable of being changed in the configuration of a reflecting surface thereof upon turning on electricity; a free curved surface prism having two opposite surfaces thereof serving as optical surface; and an imaging device for receiving a light introduced by said first and second variable configuration mirrors and the free curved surface prism,

wherein said first variable configuration mirror being disposed so as to reflect light incident on a front side of the imaging apparatus body onto a first optical surface of the optical surfaces of said free curved surface prism facing a rear side of the imaging apparatus body, said second variable configuration mirror being disposed onto said first optical surface so that the light reflected by said first variable configuration mirror and then further reflected by a second optical surface of the optical surfaces of said free curved surface prism facing the front side of the imaging apparatus body is reflected toward the front side of the imaging apparatus body; and

said imaging device is disposed so as to receive the reflected light reflected onto said second optical surface by said second variable configuration mirror.

22. The imaging apparatus according to any one of claims



9, 14, 16, 17 and 21, wherein said optical apparatus is disposed so that a plane containing an incident optical axis to said optical apparatus and an incident optical axis to the imaging device is vertical to the bottom plane of the imaging apparatus body.

23. The imaging apparatus according to any one of claims 9, 14, 16, 17 and 21, wherein said optical apparatus is disposed so that a plane containing an incident optical axis to said optical apparatus and an incident optical axis to the imaging device is parallel to the bottom plane of the imaging apparatus body.

24. The imaging apparatus according to any one of claims 9, 14, 16, 17 and 21, wherein said variable configuration mirror adjusts a focusing position by the configuration of said reflecting surface.

25. The imaging apparatus according to any one of claims 9, 16, 17 and 21, wherein said variable configuration mirror adjusts an optical power by the configuration of said reflecting surface.

26. An imaging apparatus, comprising:  
a variable optical characteristic optical device

capable of varying optical characteristic upon turning on electricity;

a zoom lens; and

an imaging device for photoelectrically converting incident light transmitted through said variable optical characteristic optical device and the zoom lens,

wherein an adjustment of the focusing position of the incident light by said variable optical characteristic optical device and a zoom adjustment by the zoom lens are concurrently effected.

27. The imaging apparatus according to claim 26, wherein the adjustment of said focusing position and the zoom adjustment are concurrently effected when taking dynamic images.

28. The imaging apparatus according to claim 26, wherein the adjustment of said focusing position and the zoom adjustment are concurrently effected when taking static images.

29. An imaging apparatus, comprising:

a variable optical characteristic optical device capable of varying optical characteristic upon turning on electricity;

an imaging device for photoelectrically converting incident light transmitted through the variable optical characteristic optical device;

a microphone for converting sound into electrical signals; and

a recording section for recording image pickup signals from said imaging device and sound signals from said microphone,

wherein an image taking with containing sound being effected while an adjustment of a focusing position of the incident light or a zoom adjustment being effected by said variable optical characteristic optical device.

30. The imaging apparatus according to claim 29, wherein said image taking with containing sound is a taking of dynamic images with containing sound.

31. The imaging apparatus according to claim 29, wherein said image taking with containing sound is a taking of static image with containing sound.

32. An imaging apparatus, comprising:

a variable optical characteristic optical device capable of varying optical characteristic upon turning on electricity;

an imaging device for photoelectrically converting incident light transmitted through the variable optical characteristic optical device; and

a display device for displaying image pickup signals obtained from the imaging device as an image,

wherein an adjustment of a focusing position of the incident light by said variable optical characteristic optical device is effected while displaying taken image on the display device.

33. An imaging apparatus, comprising:

a variable optical characteristic optical device capable of varying optical characteristic upon turning on electricity;

an imaging device for photoelectrically converting incident light transmitted through the variable optical characteristic optical device; and

a display device for displaying image pickup signals obtained from the imaging device as an image,

wherein in the case where an adjustment of a focusing position of the incident light by said variable optical characteristic optical device is not effected during displaying of taken image on the display device, said variable optical characteristic optical device is set so as to be focused to infinity or to a far distance.

34. An optical apparatus comprising a variable optical characteristic optical device capable of varying optical characteristic upon turning on electricity, an adjustment of a focusing position of an incident light being effected by the variable optical characteristic optical device,

wherein a standard image taking through a macro image taking can be effected without switching to a macro mode.

35. An optical apparatus, comprising:

a variable optical characteristic optical device capable of varying optical characteristic upon turning on electricity; and

a charging type battery for turning on electricity to the variable optical characteristic optical device,

wherein said charging type battery is disposed within a body of said optical apparatus in a manner incorporated into the apparatus body.

36. The optical apparatus according to claim 35, wherein a charging contact of the charging type battery is provided on an outer surface of the body of said optical apparatus.

37. The optical apparatus according to claim 35 further comprising an electromagnetic induction charging section for charging said charging type battery, wherein said charging type battery can be charged by electromagnetic induction from an external source.

38. The optical apparatus according to claim 35, wherein the charging type battery disposed in the manner incorporated into the apparatus body is disposed so that the act of its exchange cannot be done by the user.

39. The imaging apparatus according to any one of claims 26, 29, 32 and 33, wherein said variable optical characteristic optical device comprises a variable focal lens.

40. The optical apparatus according to claim 34 or 35, wherein said variable optical characteristic optical device comprises a variable focal lens.

41. The imaging apparatus according to any one of claims 26, 29, 32 and 33, wherein said variable optical characteristic optical device comprises a variable configuration mirror having a reflecting surface for reflecting incident light and capable of being changed in

the configuration of the reflecting surface upon turning on electricity.

42. The optical apparatus according to claim 34 or 35, wherein said variable optical characteristic optical device comprises a variable configuration mirror having a reflecting surface for reflecting incident light and capable of being changed in the configuration of the reflecting surface upon turning on electricity.